

Application No. 09/269,503
Amendment under 37 C.F.R. §1.111 dated November 10, 2004
Response to the Office Action of August 10, 2004

REMARKS

Reconsideration of this application, as presently amended, is respectfully requested. Claims 2, 4, 6, 8, 10, 12, 14 and 16 are now pending in this application, claims 1, 11, 17 and 18 having been cancelled by the present amendment, and claims 3, 5, 7, 9, 13 and 15 having been previously cancelled. Claims 2, 4, 6, 8, 12, 14 and 16 stand rejected. The rejections set forth in the Office Action are respectfully traversed below.

Claim Rejections - 35 U.S.C. § 103

Claim 1 was rejected under 35 U.S.C. §103(a) as being unpatentable over **Ouderikirk et al.** (USP 6,124,971) in view of **Nakanishi** (USP 5,587,821).

Claim 1 was further rejected under 35 U.S.C. §103(a) as being unpatentable over **Ouderikirk et al.** in view of **Crawford et al.** (USP 5,867,240), **Kikuchi et al.** (USP 5,440,413) and **Arakawa** (USP 5,528,400).

It is submitted that the above rejections of claim 1 are now moot in view of the cancellation of claim 1.

Claim 11 was rejected under 35 U.S.C. §103(a) as being unpatentable over **Ouderikirk** in view of **Crawford**, **Kikuchi et al.**, **Arakawa**, and **Ohnishi** and further in view of **Ebihara et al.** (USP 5,990,995).

It is submitted that the rejection of claim 11 is now moot in view of the cancellation of claim 11.

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Claims 10 and 17 were rejected under 35 U.S.C. §103(a) as being unpatentable over Ouder Kirk in view of Crawford, Kikuchi et al., Arakawa, and Ohnishi and further in view of Yang et al. (USP 5,847,798).

Claims 12 and 18 were rejected under 35 U.S.C. §103(a) as being unpatentable over Ouder Kirk in view of Crawford, Kikuchi et al., Arakawa, and Ohnishi and further in view of Ebihara et al. (USP 5,990,995).

It is submitted that the above rejections of claims 17 and 18 are now moot in view of the cancellation of claims 17 and 18.

Claims 2, 4, 6, 14 and 16 are rejected under 35 U.S.C. §103(a) as being unpatentable over Ouder Kirk in view of Crawford, Kikuchi et al. and Arakawa, and further in view of Ohnishi et al. (USP 5,400,158).

Claim 8 was rejected under 35 U.S.C. §103(a) as being unpatentable over Ouder Kirk in view of Crawford, Kikuchi, Arakawa, and Ohnishi, and further in view of Minowa (USP 4,697,885).

In summary, the only claims now at issue are independent claim 2 and claims 4, 6, 8, 10, 12, 14 and 16, which depend from claim 2.

Claim 2 has been amended hereby to clarify certain features and advantages of the present invention. Support for the amendments to claim 2 is provided, e.g., on page 20, line 14 through page 22, line 6 of the present application, and, more particularly, on page 21, line 14 through page 22, line 6 of the present application.

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Claim 2, the only remaining independent claim, was rejected as being obvious over **Onderdijk** in view of **Crawford**, **Kikuchi et al.**, **Arkawa** and **Ohnishi et al.** In particular, the Office Action applies **Ohnishi et al.** to teach the claimed twisted retardation film, which is not disclosed or suggested by any of the other applied references. For the reasons set forth in detail below, it is respectfully submitted that there is no incentive or motivation to combine **Ohnishi et al.** with the other applied references, and therefore the rejection is improper under §103.

More specifically, the LCD disclosed by **Ohnishi et al.** includes two types of optical compensation elements which are laminated, that is, the optically anisotropic plate 3 having a twisted structure and a retardation value, and the uniaxial phase plate 2, which has no twisted structure but has a retardation value. It is respectfully submitted that the combination of the optical quantities of these plates 2, 3 and the liquid crystal molecule in the STN liquid crystal film, including the orientation relation for color compensation, is very complicated. Therefore, it is respectfully submitted that it is not appropriate under §103 to pick and choose only the optically anisotropic plate 3 from the plates 2, 3, to assert that it would be obvious to combine the plate 3 with an STN liquid crystal cell. For example, according to the first embodiment described in **Ohnishi et al.** and EXAMPLE 1 (column 7, line 13), it can be seen that the sum of the retardation value of the uniaxial phase plate 2 and the optically anisotropic plate 3 exceeds the retardation value of the STN liquid crystal layer.

Thus, it is respectfully submitted that there is no incentive or motivation to substitute the optically anisotropic plate 3 into the combination of **Onderdijk**, **Crawford**, **Kikuchi et al.**, and **Arkawa** to arrive at the presently claimed invention. Further, because the LCD of the present

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invention has only the twisted retardation film as the element for compensation, it is quite different from the LCD of Ohnishi et al. in structure and optical effects. Accordingly, not only is there no motivation to combine Ohnishi et al. with the additional other reference to arrive at the claimed invention, but, even if combined, the result would not be the claimed invention because the Ohnishi et al. retardation structure is very different from the claimed invention.

Moreover, none of Ouderkirk, Crawford, Kikuchi, Arakawa and Ohnishi et al. disclose or suggest the features currently added to claim 2 by the present amendment. More particularly, Ohnishi et al. discloses that "a very good blank display can be obtained when an OFF voltage is applied (see EXAMPLE 3) and "the transmittance is high when an ON voltage is applied" (see EXAMPLE 4). These descriptions indicate that the characteristic of normally black is achieved in the LCD. In accordance with the invention presently recited in claim 2, the increased reflective light from the reflection-type polarizing film enables the visible light to be bright in state no voltage is applied to the liquid crystal cell, while the color of the light absorbing member can be seen in a state voltage is applied to the liquid crystal cell. Thus, the present invention constitutes a super twisted LCD having normally white mode, and for this purpose the characteristics of the twisted angle and retardation quantity of the twisted retardation film are optimized.

Moreover, neither Ouderkirk et al., Crawford, Kikuchi, nor Arakawa disclose or suggest the claimed twisted retardation film. Furthermore, none of these references disclose or suggest anything relating to normally white mode in the STN liquid crystal. The normally white

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mode of a TN liquid crystal twisted by 90° is technically different from the normally white mode of an STN liquid crystal.

The purpose of **Ohnishi** is color compensation for achieving an achromatic color display. The purpose of both **Crawford** and **Arakawa** is the improvement of the STN liquid crystal display. **Kikuchi** is related to the improvement of visual dependence of intermediate gradation of a TN cell having a twisted angle of 90°, not an STN cell. It is respectfully submitted that none of the cited references provide the requisite motivation supporting the combination of references, nor do any of the references, whether taken alone or in combination, suggest the advantage of increased reflected light provided by the presently claimed invention.

Requirements of a §103 rejection

In rejecting claims under §103, it is incumbent upon the Examiner to establish a factual basis to support the legal conclusion of obviousness. See *In re Fine*, 837 F.2d 1071, 1073 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). In doing so, the Examiner is expected to make the factual determinations set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459, 467 (1966), and to provide a reason why one having ordinary skill in the pertinent art would have been led to modify the prior art or to combine the prior art references to arrive at the claimed invention.

In ascertaining the differences between the prior art and the claims (the second factual inquiry of *Graham v. John Deere Co.*), it is essential to view the claims at issue as "*the invention*

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as a whole, without the benefit of hindsight vision afforded by the claimed invention." *Hodosh v. Block Drug Co., Inc.*, 786 F.2d 1136, 1143 n. 5, 229 USPQ 182, 187 n. 5 (Fed. Cir. 1986).

It is impermissible to ignore the *advantages*, properties, utilities, and unexpected results flowing from the claimed invention; they are part of the invention as a whole. *In re Wright*, 848 F.2d 1216, 6 USPQ2d 1959 (Fed. Cir. 1988).

The motivation for combining prior art references to arrive at the claimed invention must stem from some teaching, suggestion or implication in the prior as a whole or knowledge generally available to one having ordinary skill in the art. *Uniroyal Inc. v. Rudkin-Wiley Corp.*, 837 F.2d 1044, 1051, 5 USPQ 2d 1434, 1438 (Fed. Cir.), *Cert. denied*, 488 U.S. 25 (1988).

It is well established that it is impermissible within the framework of §103 to pick and choose from any one reference only so much of it as will support a given position to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggest to one of ordinary skill in the art. *In re Mercer*, 515 F.2d 1161, 1165-66, 185 USPQ 774, 778 (CCPA 1975).

Onderkirk et al. is generally related to a liquid crystal display having a transreflector 13 including a reflective polarizing element 8 that transmits one polarization of light and transmits another. The purpose of the transreflector 13 is to provide an LCD that can be used in both ambient and supplemental (backlight) lighting conditions (see col. 1, lines 41-60 and col. 2, lines 21-41).

For example, in a specific embodiment shown in Fig. 8 and the accompanying description, *Onderkirk et al.* disclose a reflective display including a front dichroic polarizer 10,

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LCD panel 11, transreflector 13 and absorber 33. The transreflector 13 includes a reflective polarizing element 8 and a polarization preserving diffusing element 6. In operation, the transmission axis of the reflective polarizing element 8 is preferably aligned with the transmission axis of the dichroic polarizer 10. When the LCD panel 11 transmits a light ray without affecting its polarization, a ray 43 is transmitted by the transreflector 13 and absorbed by the absorber 33, resulting in a dark pixel in the LCD 11. When the LCD panel 11 rotates the polarization of a light ray 41, the light ray is reflected by the transreflector 13 to form a reflected ray 42 that is transmitted out of the display with a diffuse appearance.

Thus, taking the teachings of the Ouderkirk et al. reference as a whole, the reference is concerned with use of a reflective polarizing element 8 as a transreflector to increase brightness in both ambient and supplemental lighting conditions. As the Office Action recognizes, Ouderkirk et al. do not disclose or suggest the claimed super twisted nematic liquid crystal cell and the claimed retardation film.

Furthermore, Ouderkirk et al. clearly do not disclose or suggest the *claimed relationship between the retardation film, the super-twisted nematic liquid crystal cell and the reflection-type polarizing film*, and the advantages provided by this combination of elements (discussed in more detail below), because Ouderkirk et al. simply do not include this combination of elements.

It is also noted that Ouderkirk et al. do not disclose or suggest the claimed light diffusion layer provided on the outside surface of the *absorption-type polarizing film*. The Office Action cites a "light absorbing member outside the *reflective polarizer*" (citing col. 17, lines 9-11 of Ouderkirk et al.), which is clearly not outside an *absorption-type polarizing film*.

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The Office action relies on Crawford, Kikuchi, Arkawa and Ohnishi et al. to supply the missing elements from Ouderkirk et al., asserting that "it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the liquid crystal display of Ouderkirk with the super twisted nematic liquid crystal cell having electrodes, a retardation film outside second substrate having relations $n_x > n_z > n_y$, an absorption-type polarizer outside the retardation film of Crawford to improve display performance." See Office Action, page 6, lines 17-21 (note, the Examiner's argument regarding claim 1 and the combination of Ouderkirk and Crawford applies to Claim 2).

Thus, the only motivation stated for combining the references is to "improve display performance."

The structure of Crawford consists of a liquid crystal display element 76 disposed between a pair of polarizing plates 70b, 64, and retarders 204, 202 disposed between each of the pair of polarizing plates 70b, 64 and the liquid crystal display element 76 (see Fig. 3).

As will be set forth in detail below, it is respectfully submitted that there is absolutely no motivation or incentive to combine the Ouderkirk and Crawford references, other than that provided by applicant's teachings, and therefore the rejection is improper under §103.

First, the motivation provided in the Office Action "*to improve display performance*" is certainly an objective of the Crawford reference. However, this objective of Crawford is achieved by a special front fiber-optic faceplate used in conjunction with dual negative retarders and a light shaping element (see Col. 1, lines 18 - 22).

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In contrast to *Crawford*, the *Ouderklirk et al.* reference is *completely unrelated* to a twisted nematic (TN) or super twisted nematic (STN) type display, and the problems associated therewith, specifically, the birefringence effects of TN or STN type displays. There is no disclosure or suggestion in the *Ouderklirk* reference that the LCD display disclosed therein requires or would benefit from an improvement in viewing angle, particularly via a retardation film, because *Ouderklirk* simply does not relate to TN or STN type displays.

Thus, it is respectfully submitted that the *Ouderklirk et al.* and *Crawford* references are directed to two different types of LCDs having different objectives, and there is no incentive or motivation to combine the STN display of *Crawford* with the LCD of *Ouderklirk et al.* reference *other than that provided by applicant's teachings*.

Second, as noted above, it is impermissible within the framework of §103 to pick and choose from any one reference only so much of it as will support a given position to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggest to one of ordinary skill in the art. *In re Mercer*.

It is respectfully submitted that Examiner has selected elements from each of the references to support the desired position to the exclusion of other parts of the references. For example, *Ouderklirk et al.* discloses two polarizer plates 70b, 64 and goes into detail regarding the arrangement of each polarizing plate (see col. 9, lines 50-54).

Thus, the arrangement of both polarizing plates 70b, 64 is important to the operation of *Crawford*. Yet, the Examiner simply selects one polarizing plate from *Crawford* and the translector 13 from *Ouderklirk et al.* when combining the references. It is respectfully

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submitted that if the STN liquid crystal cell of **Crawford** is to be substituted for the non-STN liquid crystal display of **Ouderkirk et al.**, there would be no motivation to simply substitute one polarizing plate and not the other polarizing plate, as suggested by the Examiner, because the characteristics of *both* plates are specifically chosen to improve the display quality.

Further, the **Crawford** reference stresses the importance of the FOPP optical element 78 to greatly improve viewing angle characteristics (see col. 10, lines 16 - 33). It is respectfully submitted that if the FOPP element 78 is not included with the STN display of **Crawford**, then the function of the display is destroyed.

Therefore, there is simply no motivation or incentive to substitute only selected elements of the **Crawford** structure (i.e., a polarizer, an STN liquid crystal display, and retardation film) for elements of the **Ouderkirk et al.** reference, while excluding (i.e., not substituting) other elements, such as the FOPP optical element 78 and the second polarizing plate.

Moreover, **Crawford** does not disclose or suggest application to reflective displays. Further, **Crawford** certainly does not disclose or suggest that the invention described therein is applicable to a transreflective display, as disclosed in **Ouderkirk et al.** **Crawford** only discloses a transmissive display (see first line of Abstract) and has nothing to do with a reflective or transreflective display. Vice versa, **Ouderkirk et al.** does not provide motivation or incentive for combining the display disclosed therein with a display that is *only* transmissive (as disclosed in **Crawford**) because **Ouderkirk et al.** is specifically directed to a display that operates in *both a reflective and transmissive mode*.

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Therefore, in view of the above remarks, it is respectfully submitted that there is no motivation or incentive to combine Ouderkerk et al. and Crawford, and that the Office Action has improperly used hindsight to reconstruct the claimed invention based on applicants' teachings.

Furthermore, as noted above, advantages of the invention must be considered as part of the invention as a whole. *In re Wright*. The present invention provides a unique combination of a STN liquid crystal display, a retardation film, reflective polarizer and light absorbing member that provides the advantages of improving contrast of a display by maximizing the strength of reflected light from a reflection type polarizing film at the back of an STN liquid crystal cell (see, e.g., present application, page 22, lines 1-11). More specifically, as described, e.g., on page 4, lines 1-7, excellent contrast can be achieved as a result of the reflection-type polarizing film reflecting and passing light. The excellent contrast also provides excellent viewing angle characteristics.

It is respectfully submitted that none of the cited references disclose or suggest the advantages of excellent contrast, and thereby improved viewing angle, in an STN display cell in the manner achieved by the presently claimed invention. Please note, as described above, Crawford achieves improved viewing angle in an STN display cell in a completely different manner from the presently claimed invention. Specifically, Crawford achieves improved viewing angle primarily through the arrangement of the FOPP optical element 78. Further, Ouderkerk et al. is completely unrelated to improving contrast or viewing angle in an STN display cell.

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Therefore, it is respectfully submitted that none of the cited references disclose or suggest the advantages of achieving improved contrast and improved viewing angle in the manner achieved by the combination of an STN liquid crystal display, a retardation film, reflective polarizer and light absorbing member of the present invention, which advantages *must* be considered as part of the invention as a whole.

Finally, the Examiner asserts that "applicant's added limitations regarding performance and orientation of a polarizers and retarders pertain to *well known* details of configuring said polarizers and retardation films to achieve proper polarization and birefringence compensation in a liquid crystal display device used in either a normally black or normally white mode" [emphasis added]. The Office Action goes on to state that "These are *long standing routine* steps in the construct of a satisfactory super twisted nematic liquid crystal display device with improved contrast (Applicant's light increasing means). The applied prior art is considered to meet Applicant's added limitations as these details of construction were *routine* at the time the prior art was disclosed to comprise satisfactory displays with improved contrast" [emphasis added]. See, e.g., Office Action, page 4, line 12 – page 5, line 5.

It is respectfully submitted that the "added limitations," as referred to by the Office Action, define relationships between the STN liquid crystal cell, the retardation film and the reflection-type polarizing film that result in the above-noted advantages, which relationships and advantages are not disclosed or suggested by the cited prior art.

For example, the combination of the STN liquid crystal cell and the reflection-type polarizer is not disclosed or suggested by the cited references, whether taken alone or in

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combination. By providing the STN cell in combination with the reflection-type polarizer, when the reflection axis of the reflection-type polarizing film is parallel to or orthogonal to the linearly polarized light from the STN cell light can be reflected from or passed through the reflection-type polarizing film to provide excellent contrast and increased viewing angle.

It is respectfully submitted that there is no teaching, suggestion or incentive to combine the cited references, as required under §103, and therefore the Examiner has not established a *prima facie* case of obviousness.

For all the reasons set forth above, it is respectfully submitted that the invention recited in claim 2, and claims 4, 6, 8, 10, 12, 14 and 16 which depend therefrom, would not have been obvious over the combination of Ouderkirk et al., Crawford, Kikuchi, Arakawa, and Ohnishi et al. for at least the reasons set forth above. Further, Minowa and Yang et al. suffer from similar deficiencies in combining these references with Ouderkirk et al.

CONCLUSION

In view of the foregoing amendments and accompanying remarks, it is submitted that all pending claims are in condition allowance. A prompt and favorable reconsideration of the rejection and an indication of allowability of all pending claims are earnestly solicited.

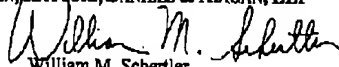
If the Examiner believes that there are issues remaining to be resolved in this application, the Examiner is invited to contact the undersigned attorney at the telephone number indicated below to arrange for an interview to expedite and complete prosecution of this case.

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Respectfully submitted,

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